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POST-WAR EMPLOYMENT IN THE UNITED STATES

The United States have played, and will continue to play, a dominant part in the world economy. Before the war U.S.A. produced nearly one half of the world's income and industrial production. It was the greatest single exporter, and second only in imports to the United Kingdom. The recently published report of the U.S. Department of Commerce, ' The United States in the World Economy,' emphasises how rapidly and with what force booms and slumps in America have in the past spread over the rest of the world. What happens in America after the war is bound to have a profound effect on the economic development elsewhere, and nowhere more than in Britain. In the paper below Mr. Steindl tries to estimate how long sufficient effective demand will be maintained in U.S.A. to ensure full employment in that country.

The American economy has gathered momentum during the war, in the sense that there has accumulated, and is still accumulating a 'piled-up' demand for consumers' goods and capital equipment, which will for a time fill the gap left by falling State expenditures on the war. Making various assumptions about the length of the war, both in Europe and in the Far East, and about the rate of demobilization, Mr. Steindl estimates how far the momentum of 'piled-up' demand will, of its own accord, carry the U.S. economy at full employment level. He shows that the critical period for U.S. employment policy is likely to occur about the year 1948, *depending, of course, upon the assumptions made about the length of the war and the scale of war expenditure in the next few years. Whether the critical period will herald a depression or not will depend on plans made in the meanwhile either for a big internal expansion or for export surpluses as a result of large-scale foreign lending.*

THE EDITOR.

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The chances of continuing full employment in the United States after the war have been much discussed, but the problem is often considered purely in terms of frictional unemployment arising out of the transition. In the present paper attention will be focussed on the basic question whether sufficient effective demand will be available to maintain full employment and for how long. It is assumed that the war in Europe will be over by the end of 1944. By 'war period' we mean therefore the years 1942, 1943 and 1944. The following period of transition can be divided into two phases, the 'Japanese phase' during which the Eastern war will be concluded, and the 'Post-War phase' proper.

I. Post-War Labour Force and National Income.

The number of employees in non-agricultural establishments on the average of 1943 was 38.3 millions. This corresponded more or less to 'full employment' except in so far as a number of people had entered the labour force who would not normally be working, and that the hours worked were considerably longer than in peace-time. While these two factors tend to reduce the size of the labour force (in terms of man-hours) to be employed after the war, two others tend to increase it: The demobilisation of men, and the natural increase in the labour force. An estimate of the relative strength of these factors is given below:

*Change in Labour Force Available.**

	Japanese Phase	*Post-War Phase*
Reduction of hours (—)	2—4 million	4—5.5 million
Withdrawal of abnormal war-time labour force (—)	1 million	4 million
	—3 to —5 million	—8 to—9.5 million
Normal increase in labour force (+)	0.7 million	1 million
Demobilisation (+)	3 million	8 million
	+3.7 million	+9 million

* The figures give the *average* change over the period considered.

In manufacturing a return to 1939 working hours would mean a reduction of the working week by 20%. In most other industries the reduction would be much smaller so that we can assume a reduction of 10—15%. In the Japanese phase the reduction will be much less, say 5—10%, because bottlenecks in equipment will make for overtime. A corresponding percentage of the present labour force will be needed to make up for the reduction in hours.

The 'abnormal' labour supply has been estimated for October 1943 at 5.8 million.[1] Part of the additional woman labour included in this sum will become permanent; apart from this a great number of school and college age recruits to the labour market will stay in it and it will therefore take a few years until this additional labour supply is eliminated. We thus assume that even in the post-war phase 2 out of the 6 million additional war-time workers will stay. As this abnormal supply of labour is later reduced (the young people having passed the school age) the natural increase in the labour force will make up for it. The normal increase in labour force has been assumed as 0.7 million p.a. and the Japanese phase to last between one and two years. The additional labour supply from demobilisation is a plausible guess, taking into account that part of the demobilised men will not come into the labour market.

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[1] Monthly Labour Review (U.S. Department of Labour) February, 1944.

As the Table shows, the counteracting forces are likely to balance each other approximately in each of the two phases, and the more so since the upper limit of the reduction in hours is likely to be reached only at the end of the period.

If employment in man-hours remains at the 1943 level in the post-war phase, the real national income in 1943 prices (which are equal to present prices) would tend to be somewhat lower than in 1943 for two reasons. The reduction of overtime and elimination of other bonuses would reduce the wage bill, and the shift from industries of high to those of lower productivity of labour would tend to reduce the average productivity. During the Japanese phase these factors will be of minor importance (shifts will be largely *within* durable goods industries). For the post-war phase we can estimate that the disposable income can hardly be reduced by more than $10 billions below the 1943 level on the basis of the two factors mentioned.[1] Such a reduction, however, is doubtful ; a considerable technical progress has come about during the war, and if the accumulated experience is applied to peace-time industries the real income per head may increase even more than in the past.[2]

II. PILED-UP DEMAND.

We shall now try to estimate the magnitude of the potential demand which has remained unsatisfied during the war and will become effective afterwards. It may be treated under the following headings: Piled-up consumers' demand, deferred replacements, deferred maintenance, reconversion, housing, replenishment of stocks, and re-extension of consumers' credit. Double counting among these items is difficult to avoid and some of the estimates must necessarily be very uncertain. The resulting estimate of piled-up demand is more reliable as an upper limit rather than as an estimate of its most likely value.

1. *Piled-up consumers' demand.*

It is to be expected that a part of the consumers' demand which remained unsatisfied during the war owing to rationing or scarcities will become effective once the goods are available again. If we look at the matter from this side it appears that demand for perishable goods and for services will hardly pile up (people will not eat the beef they were prevented from eating during the war); with regard to semi-durables it must be considered that there was no great scarcity except in a few cases (silk stockings); clothing is unrationed and the shoe ration is very liberal. Piled-up demand will therefore be mainly directed towards *durable consumers' goods.* We can estimate it if we start from the hypothesis of a normal relation between disposable income and demand for durable goods (both measured in real terms). Such a relation can be established for the pre-war years and we have only to assume that it remained substantially unaltered (see Appendix). It appears that of an addition of $10 billions to real disposable income about $1.5 billion is spent on durable consumers' goods. On this basis the 'normal' demand for consumers' goods in 1943 would have been $14.5 billions whereas the actual consumption of durables was $6.4 billions (see Appendix). The total unsatisfied demand for the war period may be estimated at $22 billions in current prices, and about the same in present prices (the price rise from 1942 to 1943 affects the value of the pile-up only little).

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[1] In manufacturing, if we compare January 1944 with January 1939, the index of straight-time hourly earnings was 6% lower than the index of gross hourly earnings. The index of straight-time earnings, weighting the various industries on the basis of 1939 weights, was 15% lower than the index of gross hourly earnings. Thus if we should return to 1939 hours and distribution of labour between industries, the hourly earnings would be reduced by 15%. For industry as a whole the correction for overtime would be smaller and we have to take into account that there can be no full return to 1939 weights of industries, because heavy industries normally bulk more largely with a higher national income. The correction for total industry would thus be less, say 7—10%. The disposable income as a whole will increase in a lesser proportion, say 5—8%. This gives a reduction of 8—10 billion in the disposable income.

[2] See S. Morris Livingston, Post-War manpower and its capacity to produce, Survey of Current Business, April 1943.

	Actual Demand	*Potential Demand*	*Pile-up*
1942	$6.6 billions*	$12.5 billions	$6 billions
1943	$6.4 ,,	$14.5 ,,	$8 ,,
1944			$8 ,,

* billion=1000 million.

There is no doubt, however, that this would be an over-estimate of the pile-up. Many of the durables, if they had been bought, would be used up by now, and the demand for those goods does not accumulate. There is also an element of 'technical obsolescence' in the normal demand for some durables such as cars. Part of the cars normally bought are only bought because they are new models. The people who would ordinarily buy a new car every year for that reason will not buy three cars after the war. Moreover, some durable goods are consumed in a shorter period. We can reasonably account for this by ignoring the first year's pile-up and thus putting the value of the pile-up at $16 billions.

We should still make an allowance for semi-durables, in order to get the total pile-up of consumers' demand. But it must be emphasised that there is a danger of double counting: the war-time scarcities led to consumption of substitutes, which will stop after the war, and the *net* pile-up will be correspondingly smaller. The total pile-up of consumers goods may therefore be put at not more than $16—18 billion in 1943 prices.

The problem of piled-up consumers' demand may also be approached from another angle, starting from the accumulation of personal savings during the war. It would be wrong to regard *liquid* savings as potential demand, as some writers have done, as the liquidity is not necessarily indicative of an intention ultimately to consume the savings. We can, however, on the basis of a normal relation between income and saving (see Appendix) estimate the *abnormal savings* in the war period. They probably amounted to something like $39 billion (this excludes the repayment of consumers debt). Even of these abnormal savings not all will become consumers' demand. As they are highly concentrated a great part of them will remain permanent. Even of the part of savings which is more scattered, a proportion will be retained and become effective only if there is unemployment. Our above estimate of pile-up is $16 to 18 billions ; even if we add to this a part of the piled up demand for housing (which is below estimated at $10 billions, a great part of which will, however, be *hired* and not bought by the occupier) the sum is of the order of *one half* of the accumulated abnormal saving. This is a plausible figure in view of the reasons given above, namely that the strong concentration of personal saving makes it likely that a great part of the abnormal saving will not become demand for consumption goods.

2. *Deferred replacement and maintenance.*

The following figures for private gross investment and depreciation during the war give an indication of the extent of under-replacement.

	Private Capital Formation (Construction and producer's equipment)	*Depreciation and Depletion*	*Depreciation and Depletion corrected for Price Increase*
1942	$8 billion	$7.8 billion	$9 billion
1943	$5 ,,	$8.2 ,,	$9 ,,
1944	$5 ,,	$8.2 ,,	$10 ,,
	—		—
	$18 billion		$28 billion

Source :—Survey of Current Business, April 1944.

The depreciation figures are, however, certainly too high. They include depletion (writing off of wasting resources like minerals). They overestimate the need for replacement because the tax laws have allowed generous depreciation in recent years.[1] We can, on the basis of these considerations, put the re-investment demand at $6—7 billions instead of $10 billions.

The next item, deferred maintenance, has been put at $2 billion as a generous upper limit.[2]

3. *Reconversion and Conversion.*

Apart from the replacement so far considered there will be an additional demand for investment immediately after the war, for the simple reason that consumption will be much higher than in peace-time and additional plant will be required for the additional production. The amount can only be guessed but we can pin it down between fairly plausible limits.

The expansion of the national income to its present level, with its present composition (i.e. a large proportion of war production) has been brought about with a capital investment in war plant of $20 billion.[3] Doubtless, with an income adopted to peace-time needs, much less capital equipment would have been sufficient because the capital intensity in the heavy industries is particularly high.

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[1] That the depreciation given in general overestimates the degree of capital consumption is confirmed by *Milton Gilbert and George Jaszi* (Survey of Current Business, March, 1943, p. 13).

[2] S. Morris Livingston and E. T. Weiler: 'Can Business Finance the Transition ?' Survey of Current Business, February 1944.

[3] The total investment in plant in manufacturing industry before the war was about $60 billion. Survey of current business, May 1942 ; Guaranty Survey, March 1944.

Moreover, a part of the war plant built is either in its present form useful for peace-time production, or it can be 'converted' to peace-time uses, in the same way as the 'converted' plant, e.g. in the automobile industry must be reconverted to peace-time uses. The *private* investment in war-plant of $4.5 billion (included in the above $20 billion) is probably all either useful or already written off. But over and above this there is suitable plant for conversion. The War Production Board estimates that 40% of the $20 billion war plant (i.e. $8 billion) are useful and 30% ($6 billion) to a lesser extent useful.[1] A large part of the necessary plant for peace-time production can therefore be provided by conversion (say at least $8 billion worth of plant) ; only some additional investment in new plant, say $4 billion will be needed, to give an adequate addition to the capital stock. The total cost of reconversion of old plants, conversion of new war plant and additional investment may be put at $5—10 billion.[2]

4. *Housing.*

The demand for (privately built) dwelling houses is clearly a very uncertain factor. The houses built during the war for workers are of a very temporary nature and some migration will take place again after the war. We cannot neglect, therefore, the possibility of a considerable piled-up demand for houses. If we put the private residential building to be expected at the level of employment and income of 1943 at $5 billion,[3] the piled-up demand should be about $10 billion.

5. *Replenishment of Stocks and Re-extension of Consumers' Credit.*

If the relation of stocks to sales in retail trade in 1939 is taken as normal, the present stocks would have to be increased by $2.5—3 billion to correspond to the level of sales. We have still to consider stocks in wholesale trade and manufacturing. In the latter case they are fairly high, but composed partly of goods which are useless in peace-time. On the other hand, there is a counteracting factor : the Government holds considerable stocks of various goods, part of which (raw materials) will be needed in peace-time consumption. Even though they may be sold gradually they will, no doubt, offset at least to a great part the demand for replenishment of stocks.[4] It would seem, therefore,

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[1] Guaranty Survey, March 1944.

[2] The equipment cost of reconversion of those plants which were converted from peace-time uses will be $2 billion at the most (S. Morris Livingston and E. T. Weiler *op. cit.*) while the total replacement cost of this plant before conversion was $4 billion. Thus we have :

Reconversion cost of old plant	$2 billion
Conversion cost of $4 billion war plant	$2 ,,
Additional new plant	$4 ,,
	$8 billion

which is just between the limits given above.

[3] This is the level of private residential building which we should expect on the basis of the relation between income and private residential building established in the 'thirties. The actual total residential building during the war period was $3 billions.

[4] The value of such Government stores to be sold in the home market is officially estimated at $6 billion. *Economist,,* Aug. 26, 1944.

that a total sum of $5 billion for replenishment of stocks is a sufficient maximum estimate.

The re-extension of consumers' credit will provide an additional demand of about $3 billions.

The total pile-up is thus composed as follows :—

Piled-up-Demand in 1943 *prices.*

	$ billion
Pile-up of consumer demand	16—18
Capital Replacement demand	6—7
Deferred Maintenance	2
Reconversion and extension of capital stock	5—10
Housing	10
Replenishing of Stocks	5
Re-extension of consumers' credit	3
	47—55

It could very well be lower ; but it can hardly be more.

III. THE JAPANESE PHASE.

At this stage of the argument we have to make some arbitrary assumptions, and it is left to the reader to modify them in the light of later experience. The first is that there will be no reduction in taxation during the Japanese phase. The second concerns the extent of the cut in war expenditure : We assume, alternatively, a 25% or a 33% cut from the war expenditure of 1943 which was about $90 billions. Thirdly we assume that frictional unemployment on a considerable scale will be avoided and the national income maintained at 1943 level. With a gradual reduction in war expenditure, and some measure of control, this should be possible. Lastly, it is assumed that inflation on any considerable scale will be avoided both in the Japanese and Post-War phase.

It follows that revenue will be maintained and the budget deficit therefore reduced by the same amount as the war expenditure, i.e. $23 or $30 billion, alternatively. The reduction in the deficit will make it possible to release material and labour for civilian production. The first call on these resources is the re-establishment of the normal level of replacement, of consumption of durable goods, and of housing. This may be listed as follows (the figures are easily obtained from the above discussion of piled-up demand) :

	$ billion
Making up capital investment to the level of replacement ($8 minus 5 bill.)	3
Increase in durable consumers' goods production to the level of 'normal' demand	8
Increase in private construction of dwelling houses	4
	15

Resources released from war in excess of those needed to satisfy this demand will be available to absorb a certain amount of the piled-up demand. How much, depends on the duration of the Japanese phase. We shall assume, alternatively, 1 year or 2 years. The amount of piled-up demand absorbed under the alternative assumptions is shown below.

Absorption of piled-up demand.

	Extent of cut in war outlay	
Duration of Japanese Phase	25%	33%
1 year	$8 billion	$15 billion
2 years	$16 billion	$30 billion

The amount of piled up demand which will remain after the Japanese phase is :

Piled up demand	47—55
Release during Japanese Phase	30— 8
Remaining Pile-up	£17—47 billion

The larger of these estimates is only likely with a duration of 1 year of the Japanese phase. If it lasts 2 years the estimate would be below $30 billions.

IV. THE 'NORMAL' POST-WAR SAVING.

How long is the pile-up likely to provide full employment in the post-war phase ? This depends on the amount of saving which will be forthcoming with full employment. The present saving gives no indication because a part of it is 'abnormal,' determined by scarcities and war conditions. A basis for an estimate is the normal relation of personal savings and disposable income established before the war. This relation is shown in the figures given in the Appendix. The treatment of consumers' credit in this connection requires explanation. An extension of consumers' credit may be regarded either as 'dissaving' (living above their means) of some people which compensates some saving of others, and leaves us with the net balance of personal saving, which is obtained as the difference of disposable income and consumption. Or it may be regarded as 'investment' in which case we have to add it to the net personal saving (disposable income—consumption) to get the personal savings *gross*. The latter procedure is the correct one if we are looking for a relation between saving and income, because the expansion of consumers' credit is determined by factors different from those which determine ordinary saving and dissaving (it depends e.g. on availability of goods suitable for instalment credit, on the saturation of the market with these goods, etc. and it probably reaches certain limits with the increase in employment).

On the basis of the relation obtained it appears that the 'normal' saving out of 1943 disposable income would have been $18.5 billions. If we add to this $5 billion corporate saving and $8 billion depreciation we get a gross saving of $31.5 billion. Now we must take into account the possibility that the disposable income in the post-war phase will be $10 billion lower than in 1943. On the other hand, taxation will be much reduced, perhaps by something like $20 billion. These changes work in favour of an increase in gross saving which is therefore likely to be at least $32—34 billion.[1]

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[1] It may be admitted that it is hazardous to estimate the post-war propensity to save on the basis of a pre-war relation, first because the given relation has to be extrapolated over a wide range, and second because the possibility of a shift of the curve is left out of account. The likely error is, however, all in one direction : The marginal propensity to save is likely to *increase* with an increase in income. Again, a downward shift in the curve is unlikely, because there is no prospect of a redistribution of income from savers to non-savers. The amount of post-war saving can therefore be hardly less than indicated.

If we make allowance for replacement ($8 billion) and for a current demand for private building ($5 billion) we are left with about $20 billion per annum to finance the release of piled-up demand. The pile-up will therefore be exhausted within two years, if the Japanese phase lasts two years, i.e. it will be exhausted in the course of 1948. If the Japanese phase lasts one year it will be exhausted in the third year after, that is, early 1948.

We must now remember that the estimate of pile-up was very liberal, and that exhaustion may therefore come earlier. It can, however, hardly come earlier than in 1947.

After the exhaustion of the piled-up demand there will arise the problem of finding an outlet for about $32 to 34 billion gross savings. As private investment in construction and producers' equipment in 1941—at its peak—was $14 billion, it is by no means fantastic to expect that public deficit spending of the order of $10—15 billion or more on the average of years would be necessary to provide the lasting full employment, of which the American economy has had a taste in the war period.

An alternative outlet for the saving could be found in export surpluses, whether privately or publicly financed. The continuation of full employment after the critical year in which the piled-up demand is exhausted will depend on whether public works (or any kind of deficit spending) together with export surpluses will be pushed to the level indicated above.

J. STEINDL.

APPENDIX

Disposable Income, Savings and Durable Consumers' Goods.

$ billions

	Personal Saving (1)	Change in Consumers' Debt (2)	Gross Personal Saving (1) + (2) (3)	Gross Personal Saving at 1939 Prices (4)	Disposable Income (5)	Disposable Income at 1939 Prices (6)	Flow of durable Consumers Goods (7)	Ditto in 1939 Prices (8)
1929	8.8	+0.9	9.7	7.8	79.6	64	9.9	7.5
1930	5.8	—0.7	5.1	4.3	70.7	59	8.1	6.6
1931	5.4	—1.2	4.2	3.9	59.6	55	6.3	5.7
1932	2.6	—1.3	1.3	1.3	45.6	46.5	4.2	4.3
1933	2.1	—0.1	2.0	2.2	44.5	48	3.4	3.7
1934	3.3	+0.4	3.7	3.9	51.0	53	4.8	5.0
1935	4.1	+1.0	5.1	5.2	56.3	57	5.7	6.0
1936	6.1	+1.2	7.3	7.3	65.2	65	6.7	7.0
1937	6.7	+0.7	7.4	7.2	69.2	67	7.6	7.5
1938	4.4	—0.4	4.0	3.9	62.9	62	6.0	6.0
1939	6.0	+0.9	6.9	6.9	67.7	68	7.1	7.1
1940	7.3	+1.2	8.5	8.4	72.9	72	8.2	8.0
1941	14.2	+0.7	14.9	14.0	88.7	84	10.3	9.5
1942	28.0	—3.4	24.6	21.0	110.0	94		
1943	33.0	—1.0	32.0	25.8	124.0	100		

Source:—Survey of Current Business, May 1942, March 1943, April 1944, (line 1—6), April 1942, May 1943 (line 7—8).

1. *Saving and Disposable Income.*

From the above figures we obtain the regression equation for real disposable income (X) (that is, income payments minus personal taxes paid) and real 'gross' personal saving (Y) *for the years 1929—1940 :*

$$y=0.24x-9.2 \qquad (r=0.84)$$

The Department of Labour cost of living index is used for deflation. With the 1943 disposable income of $100 billion in 1939 prices the normal saving would be $15 billion, or $18.5 billion in 1943 prices.

The 'abnormal saving' (difference between the actual value of saving and the value obtained from the regression equation and inflated with the price index for the respective year) for the period 1941 to 1944 (assuming it to be the same in 1944 as in 1943) totals $39 billions. As this is 'gross personal saving' it excludes repayment of consumers' debt.

2. *Durable Consumers' Goods.*

As figures for consumers' expenditure on durable goods are not available for the period, the flow of durable consumers' goods was used instead (Survey of Current Business, April 1942). This includes Government purchases of such goods which introduces a small element of error

The regression equation for real disposble income and flow of durable. consumers' goods, deflated with the appropriate index, for 1929—41 is

$$y=0.16x-3.4 \quad (r=0.94)$$

Neglecting the influence of Government purchases, we assume that about 0.15 of an increment in real disposable income is spent on durables; in 1941 consumers' expenditure on durable goods were $8.4 billion in 1939 prices; with the increase in disposable income by $16 billion they should have risen to $11 billion in 1943, which is $14—14.5 billion in 1943 prices.

It may be noted that we have not taken account of the fact that part of the durables are provided by an expansion of instalment credit, which we considered separately as a part of piled-up demand. This means that the value of piled-up demand for durables is definitely a high estimate.

ECONOMIC PROBLEMS OF PRE-FABRICATION

Although the technical and qualitative aspects of the pre-fabricated Portal Bungalow[1] have been widely commented upon, the significance of this new development with regard to building costs and building finance has received less attention. But this Ministry of Works experiment may have effects far beyond the sphere of emergency housing. It is the first large bulk purchase of durable consumers' goods for civilian use by the Government ; it is also, not only in this but in any country, the first *completely* pre-fabricated house to be produced on a mass-scale. The programme means that about half of all new residential houses to be built in the first two years after the war will be financed by the Central Government. The success or failure of this experiment will clearly exercise a profound influence upon the future of pre-fabrication, of Government bulk purchases, and of housing finance.

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[1] This description was first used by the Minister of Health, in the House of Commons, on Aug. 1, 1944.

The success of the Portal Bungalow, the official name of which—'Emergency Factory-made-House'—should be kept in mind, will depend on how far its short life-time of 10 years is balanced by cheap and more speedy erection and how favourable building costs—expressed in material and man-power—and the comfort offered compare with more traditional methods. The exhibited sample house does not provide any clue to costs or speed of erection, since it is a prototype erected by hand, without jigs and tools. But some data have been given by Lord Portal[1] and by the Minister of Health, Mr. Willink.

PROBLEMS OF ERECTION.

Erection of the first pre-fabricated houses can be expected six months after the building programme has been started upon, the time being needed for the arranging of jigs and tools. Another three months will be necessary to reach full production, which will be in the neighbourhood of 2,000—2,500 houses a week. Thus, in the first year from the start some 75,000—80,000 houses may be built, and in the second and each following year some 110,000, so that a programme of 500,000 houses could be fulfilled in not quite five years. But the total number of Portal Houses to be built has not yet been decided and may be considerably smaller.[2] In the first two years when the building industry working with more traditional methods has not yet regained full capacity the Portal Bungalow will contribute 200,000 dwellings, which is 5% of the total post-war residential building programme, planned for fulfilment in ten years.

The speed of erection and the realisation of the building programme are entirely dependent on the necessary land being ready. The Minister of Health pointed out in the House of Commons that it would be disastrous if the delivery of the bungalows could not be taken when they were ready. At present, local authorities own sites for only some 250,000 houses ; that is, they are even short of sites for 50,000 houses to fufil the programme of 300,000 'permanent' houses planned for the first two post-war years. Since surveying, acquisition, development, approval of lay-out and of building plans take considerable time, it is not certain that the main advantage of the Portal Bungalow—speedy erection—will not be lost, and that temporary dwellings will be erected in addition to and not instead of permanent dwellings on the land available. Another feature of the Portal Bungalow in relation to land is the size of the frontage, which measures 34½ feet compared with a norm of some 18 feet, so that almost twice as many two-storey permanent or semi-permanent houses could be built on the same frontage. If the land were used for blocks of flats, the ratio of temporary to permanent houses per unit of land might be in the neighbourhood of 1 : 5. The extensive frontage of the Portal Bungalow may easily lead to their being placed very close to each other without sufficient space in-between, the more so as no regulations in this direction have been issued and the decision is left to local authorities which are responsible for the acquisition of the sites and the development of the roads and services.

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[1] Debate, House of Lords, May 2nd, 1944.

[2] 500,000 bungalows erected in five years would compare with some 1,200,000 houses in the same period and with some 2,500,000 houses in 10 years to be built by traditional methods according to the Government 3,000,000 house programme.

Since mass-produced fittings etc. can also be used in permanent dwellings and in other types of pre-fabricated houses, it seems that it is the carcase of the Portal Bungalow which is expected to offer great advantages with regard to saving in man-power, above all in bricklayers. But the post-war position of skilled building labour is still unknown. It is possible that certain bottlenecks in available building labour will arise ; these will depend on the principles of demobilisation and on the character of repairs to damaged property. There is a likelihood of a relative shortage say of plumbers and joiners compared with bricklayers.[1] By receiving priority a high percentage of the 110,000 bricklayers of pre-war days could possibly be made available. In case of an unavoidable shortage of bricklayers, the choice of alternative materials to brick still remains.

The annual programme of 150,000 permanent houses compares with 340,000 houses built in 1938, in spite of an unemployment of over 10%. Assuming full employment and allowing for the progress in mechanisation and for the application of mass-production methods a normal annual output of 400,000 permanent dwellings could be expected. There is thus a margin between actual and potential residential building of 250,000 houses annually. If the necessary repair work should prove of such magnitude that no skilled labour could be spared beyond or even for the erection of the 150,000 'permanents,' then the Portal Bungalow or any other type of pre-fabricated house would suffer too, since, contrary to general belief, the erection of well-constructed pre-fabricated houses requires skilled labour, though partly of a different kind.

So far no cost data on houses of which everything except the carcase of the house was mass-produced have been given (i.e. if the carcase was built by more traditional methods, and stairs, floors, fittings etc. by prefabrication). The yearly net gain in the total number of houses newly erected, if the Portal House method is used (i.e. if the carcase is prefabricated as well) may be of a small magnitude only. However, no alternative methods of construction have been accepted and the merits of the Portal Bungalow with regard to speed of erection, are, therefore, difficult to assess.

The costs of this emergency-house are not yet known, Lord Portal stated that he was 'aiming at' £550 per house, but he added that it remained to be seen whether he would succeed in keeping the cost to that figure. The manufacture of the house is to be on a 'cost plus' basis which, according to Reports of the Select Committee on National Expenditure shows considerable deficiencies.[2] The record of war contracts provides ample evidence how far final costs of new structures can diverge from first estimates. This tendency is also seen in those residential building contracts which have been executed by traditional methods during the war. The costing for these contracts can be based on long experience, but we find that the highest tender for cottages, parlour type, according to Ministry of Health plans, was £1,004[3] and the average £807,* but the highest final costs of 64 rural houses[1] was £1,177 and the average (weighted) £1,021. The average cost of 66 houses built in Wales was £1,010 (£959 for non-parlour).

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[1] Not many British bricklayers will probably be needed in the British army of the post-war period.

[2] See ' Economic Incentive and Efficiency in War Industry,' by J. Steindl, BULLETIN Vol. 3, No. 8.

[3] Hansard, 22nd and 23rd July, 1943. See my article 'Labour Costs in Housing,' BULLETIN Vol. 5, No. 14.

Lord Portal's estimate of the costs of the pre-fabricated bungalow included cupboards and fittings. The approximate costs of the additional improvements introduced as a result of public criticism have been given as in the neighbourhood of £50.[2] The £600 seem to consist of £50 for piping and drainage, £50 for erection and transport, £100 for cupboards and kitchen units, £175 for steel in carcase (which with some 5½ tons of steel sheet per bungalow works out at roughly £32 per ton) and £225 for bath, lavatory and other installations. The cost of land and of lay-out such as gardens, fences etc. and also the making for roads, drainage and sewerage is excluded, while transport and the joining up with the main sewer is included in the cost. The final all-in cost of the improved model might be between £650 and £700.

THE ECONOMIC RENT

The significance of the above price can be seen only when it is related to the life-time and quality of the house and to the costs of repair and maintenance. The costs of fuel, for instance, depend on how well the insulating material used will stand up to the climate and to wear and tear. Assuming the official life-time of 10 years and allowing 50% for the second-hand value of the fittings and the scrap value of the shell after that time, the redemption of the capital cost, at 3% interest, will equal a weekly charge of some 19/-. Considering a quick technical advance in labour saving machinery and building technique in the post-war period and the probable decline of building costs after the first few years of the building boom, we need hardly expect the depreciation of the Portal Bungalow, after the assumed average life-time of 10 years has expired, to be less than 50%. About cost of maintenance and operation no data exist with respect to the Portal Bungalow, and very little information on other pre-fabricated houses has been forthcoming.[3] Even a recent Government inquiry[4] did not throw much fresh light on this very dark corner in the field of new building technique.[5] But it seems that there is not much difference in the cost of construction and of maintenance between traditional and pre-fabricated houses, a fact confirmed so far by American experience. The problem of repair of pre-fabricated houses (which is likely to consist rather of replacement of parts of the house) can only be appreciated (and solved) in the course of the life-time of the house. Assuming a possible 50% increase on the pre-war minimum standard of 2/1 per week for *running costs* (repair, insurance, vacancies, default and management) we have to add another 3/-. No statement has come forward yet about the mode of assessment for rates on the Portal Bungalow, but an average charge of some 4/- may be assumed. We thus arrive at a weekly rent (plus rates) of about £1 6s.[1]

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* See Note 3 on previous page.

[1] Minister of Health in House of Commons.

[2] Covering the improvements to the height of the room and to ventilation, the provision of a back door and the shed outside; the stainless steel sink and drainage board shown in the improved model are, it seems, not included.

[3] The two great pre-fabrication firms, R. G. Tarran and Gyproc, do not yet provide any relevant figures on the cost of their houses.

[4] Inter-departmental Committee, Post-War Building Studies 1, House Construction.

[5] The Inter-departmental Committee had to report that 'available information on the initial cost, cost of maintenance and speed of erection of the novel elements of construction was of a very general and incomplete nature, and inquiries gave somewhat negative results.'

Odd as it may seem on first sight, the rent for the Portal Bungalow will differ in different parts of the country since it is left to the local authorities to fix the amount they will charge, and since local authorities will differ in their financial policy, for instance, which rates to charge, which sum to pay to the Exchequer, etc.

Estimate of Necessary Average Weekly Rent, for Portal Type, 10 *years life-time.*

Running Costs	3/-
Rates	4/-
Capital Cost	
assuming a depreciation of 70% of original cost	24/-
50% „ „ „	19/-
30% „ „ „	15/-

CONFLICTING TRENDS IN BUILDING POLICY

The initial capital expenditure for the Portal Bungalow is to be spent in the first post-war boom years.[2] Housing needs are so pressing that this expenditure cannot be deferred until the first post-war slump appears. It is not clear whether the money spent on Portal Bungalows falls within the anti-cyclical programme as laid down in the White Paper on Employment Policy according to which public expenditure should be concentrated in the depression years.

The present position is further complicated by the fact that, while an emergency solution is wanted for satisfying urgent housing needs, at the same time a stable expansion of building labour—as planned for a 10—12 year period—is to be brought into harmony with a programme of fluctuating building activity adjusted to the whims of the trade cycle. The plans to tackle these different tasks[3] have not yet been co-ordinated. While the large-scale expansion of building labour would need stable and guaranteed employment as an incentive for new building recruits, the Government backing of mass-produced houses and the need for a reserve of unemployed building labour ready for the periods of public building activity[4] may work as a deterrent for prospective building craftsmen.

On the other hand, a restrictive attitude by building craftsmen to the wider use of machinery, mass-production and scientific costing will adversely affect, most of all, the working class in their capacity as consumers. They, together with the lower middle class, suffer more than others from the lack of new, comfortable, low-cost houses. The reduction of costs in traditional building would widen the potential market so considerably that technical unemployment would probably be avoided, or at least not be greater than it was when pre-fabrication and mass-production were not yet used on a large scale.

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[1] Mr. Silkin in the House of Commons gave the economic rent of the Portal Bungalow, including rates, as 36½ sh. outside London and 52 sh. in London, assuming, it seems an almost 100% depreciation and/or higher rates.

[2] No money shall be spent on the provision of Portal Houses after October 1947.

[3] i.e. the White Paper on Training for the Building Industry, the White Paper on Employment Policy and the Programme for the Mass Production of the Portal House.

[4] Building workers could not possibly be shifted and trained as quickly as the onset of a slump would demand.

The reduction in building costs may, however, be unfavourably influenced by the Government programme of subsidies to private enterprise housing, which, to a certain degree, conflicts with the Portal Bungalow programme. The latter was, among other things, intended to exert a pressure on private enterprise by demonstrating that the State can provide low cost houses if private enterprise should not be able to build at reasonable prices. But the recent decision of the Government to subsidise private enterprise and to relate the subsidy to building costs after the war[1] will rather work against a fall in building costs.

Still another problem which remains unsolved may be mentioned: that of geographical allocation. Although decisive for the housing programme of local authorities, this problem may have to wait until other parts of the Government's reconstruction programme have been settled. Local authorities will also be unable to decide on housebuilding by traditional methods until they know their quota of Portal Bungalows.

CO-ORDINATION OF THE BUILDING PROGRAMME

There are thus still so many unknowns that it is not yet possible to answer the decisive question of how the Portal Bungalow will affect building costs and building activity. It has been claimed[2] that with mass-produced standard fittings a small house as cheap and as quickly erected as, but better planned and more permanent than the Portal Bungalow, could be erected in bricks and other available material. Much doubt has been expressed by building technicians about possible moisture penetration, condensation, excessive noise and vermin in the Portal Bungalow.[3] In the Dudley Report recently published by the Minister of Health[4] it is stated that 'the case for entire pre-fabrication is by no means yet established.

Since total pre-fabrication is still—and may for a few years to come remain—in the experimental stage, a large-scale Government-financed building programme based on one type of house and of material seems a great risk. Many alternative materials and methods based on mass-production are available, and the problem of unused productive capacity in the post-war years will play as big a role in the aircraft, light metal and cement industries as it does in the steel industry.

Should the Portal Bungalow, being necessarily of an experimental nature, show in course of time major deficiencies,[1] opponents of 'state interference' and of pre-fabrication may use this opportunity for creating a general prejudice against new ways and methods of building cheap and comfortable houses. In view of the importance of the first State financed pre-fabricated model, possible alternatives to the Portal type may not only help in meeting the immediate post-war emergency but may also contribute to solve the urgent long-term problem of low-cost housing. With the same end in view, the building industry as a whole will have to face the urgent task of how to overcome the low productivity caused by the lack of co-ordination, of standardisation, of sufficient modern machinery and of scientific costing and management. In this respect a policy on the lines recommended[2] by the Bossom Mission to U.S.A. would contribute towards achieving that saving in man-power and costs which is necessary for residential building.

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[1] The Report on 'Private Enterprise Housing' the recommendations of which have been accepted by the Ministry of Health states that if the amount of subsidy has to be decided in advance, it 'might take the form of a substantial proportion of the difference between the actual average cost of building immediately after the war and the estimated average cost when building prices have reached stability.'

[2] See *Observer*, July 9th, 1944, and *Architects' Journal*, July 20, 1944.

[3] 'Adapted army hut,' 'tin can,' 'Heartbreak House,' 'Inhuman,' not suited 'to house young growing family for 10 years,' making occupants 'nervous wrecks after a few months,' 'danger of rapidly expanding belts of rusting suburban slums' are among the critical remarks, taken from articles and correspondence in the periodicals uilding,' and 'Architects' Journal.' There is, of course, general agreement on the many positive achievements of the experiment.

[4] Central Housing Advisory Committee.

The reorganisation of the building industry may take many years; the building up of a balanced labour force will also take some time. For the first post-war years, the Government, with their emergency housing programme, have taken the initiative in meeting an emergency. In the objections to be raised against this programme a clear distinction should be drawn between those general principles to be welcomed, such as pre-fabrication and Government bulk purchases, and, on the other hand, the details of the scheme such as the particular type of the house chosen, its life-time, location etc. The exhibition of the Portal Bungalow for public criticism and the Debates in Parliament on the Temporary Building Programme show that more information is needed on the Government's building programme as a whole and on the special problems of pre-fabrication.

S. Moos.

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[1] The effect of the Portal Bungalow on the Birth Rate, for instance, could not be dealt with in the framework of the present article. The test couple now living in the model Portal Bungalow are childless, husband and wife (twice bombed out before) both going out to work.

[2] The most important of these recommendations were :—Improved organisation and co-operation on the job, fuller provision for costing and statistical research and for publication of statistics. General application of the time and progress schedule system, increased employment of scientific workers for industrial research, greater use of plant, machinery, and hand-power-tools, standardisation of dimensions of components and equipment.

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